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APPENDIX B

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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

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TITLE OF THE INVENTION (280 characters max)

ENABLE USER CHOICE IN A SYSTEM USING APPLICATION INFLUENCED POLICY

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METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT (check one)

Applicant claims small entity status. See 37 C.F.R. § 1.27.

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**PROVISIONAL
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\$150.00 (114)

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

No.
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Respectfully s
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Date November 6, 2000

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(10/00)

Enable user choice in a system using application influenced policy

The invention described in this document is based on the solutions for application influenced policy control disclosed in the provisionally filed patent with application number: 60/206,186 filed on May 22, 2000.

1. Introduction

During the last S2 drafting meeting, it was agreed that it shall be possible for operators to employ an IP Policy Architecture for applications that require stringent QoS, e.g., carrier-grade IP telephony, where the GGSN is the policy enforcement point. On the other hand, it was also recognised that the existing GPRS mechanisms and GPRS roaming concepts/agreements should remain intact, and the usage of GPRS in the 'classic' sense should continue to be possible.

Given the above requirements, the 'principle of user choice' is highlighted as an important means for ensuring that market forces select the appropriate structure of services for total success of the industry. An example solution is presented which supports the principle.

2. Discussion

It is not an easy task to predict what applications or services will motivate users sufficient enough to lift the wireless multimedia mass market, nor to even predict if there is a correct formula in the business. However, within the framework of a volatile industry for which the internet is an example, the phrase 'customer is always right' has even greater significance than ever. It is the individual user who determines what services he needs, how to use the services, which to use among alternatives, and last but not least, it is the user who casts the vote on where to put his money. It is the collection of users who eventually decides the appropriate structure of services. Providing users with choices allows the natural selection of 'killer' applications, which will be key to the success of the wireless multimedia mass market.

Operators who own (either directly or indirectly through roaming agreements) the bearer resources have the 'home court advantage' when they also provide the service. Operators have the capability to provide bundling of service and bearers which can provide good cost performance offerings to users. The bundling may be done in different ways, one simple way would be to employ an appropriate

cost structure, while provisioning good quality bearers to the service. The operator is in a good position to provide user with attractive choices.

Operators have the capability to prevent theft of service, and the use of application-influenced policy control (e.g., IP Policy Architecture) is one of the mechanisms the operators could employ. By preventing theft of service, the operator can facilitate the realisation of providing good cost performance offerings to users. The operators can prevent theft of service.

It is envisaged that majority of users will be everyday folks who make decisions based on the simple logic of cost performance. However, there will be a minority who would like to determine the very services they would like to receive. These people may be instrumental in creating new services that are outside the offering of the operator, but which could turn out to be 'killer applications' in the long run, leading to progress in the industry. Operators will be in a good position to capitalise on successful inventions and ideas eventually. Users should be allowed to choose services that are outside the service offering of the operator.

3. Proposal

The following 'principle of user choice' is proposed for acceptance by the S2 delegation. The text can be added to either TS23.228 or TS23.207 if there is support in S2 for the principle.

The user shall, according to his choice, be able to:

- Set up a 'classic' GPRS bearer according to GPRS roaming agreements to the service of his choice.
- Decide whether an operator-offered application-influenced policy shall be applied to the GPRS bearer he is using.

4. Example Solution

4.1 Token from the P-CSCF

A token is used, which is issued by the P-CSCF for application-influenced policy control and sent to the UE. The scheme proposed in SIP Extension for Media Authorisation <draft-dcsgroup-sip-call-auth-02.txt> may be used, where the SIP-Proxy provides the User Agent (UA) with a Media-Authorisation-Token.

The token is issued by the P-CSCF when the P-CSCF recognises the media requirements in SDP and the visited operator allows enforcement of application-influenced policy on the particular media flow. One token is issued per decision on the session level. The token is passed from the P-CSCF to the UE during the session level transaction process.

One decision and one token corresponds to one SDP flow that is authorised to be activated by the P-CSCF. The P-CSCF outputs the association between token and the SDP media requirement to the IPPC, and is not required to keep any token states. The IPPC makes the policy decisions on each SDP flow. The policy decisions together with the token can either be pushed down to the GGSN where they are cached (push model), or can stay in the IPPC until further requests from the GGSN (pull model).

The token is not issued when the P-CSCF does not recognise the media requirements in SDP or when the visited operator does not want to enforce policy control on the particular media flow.

From the perspective of the user/UE, the token corresponds to certain advantages and discounts. However, to avail of this, the bearer he is using will be subject to application-influenced policy control by the visited operator. The UE submits the token during the PDP context activation/modification only if he agrees to this condition. The token is sent transparently from the UE to the GGSN.

The UE decides which PDP context to use to submit the token. For the sake of simplicity, only one token (corresponding to one SDP flow) is used per PDP context activation/modification. For the case of subsequent SIP 'Invite' which involve new SDP, it is the UE's choice whether to override a previous SDP in an existing PDP context by modification, or to create a new PDP context by activation, using the token.

(Note: In SIP, there is no notion of association between SDP's which means that each SDP's are treated as independent flows, as far as the CSCF's are concerned. It is up to the UE, who understands the needs of the application, to decide the precedence and association among the SDP's.)

(Note: The possibility of multiple tokens per PDP context and corresponding use cases are FFS.)

The GGSN can initiate the application-influenced policy control on the bearer only when the token is received during PDP context activation/modification.

The GGSN uses the token to 'activate' and enforce the pertinent policy decision that has been cached (in the push model), or to initiate an inquiry to the IPPC for appropriate policy decision (in the pull model). The GGSN also proceeds to initiate deletion of old tokens and corresponding policy decisions associated with SDP's in PDP contexts that have been overridden by the UE with PDP context modification that carry new tokens for new SDP's.

The GGSN or IPPC only has to keep a fresh batch of tokens and corresponding policy decisions that either are currently enforced in active

PDP contexts, or pending/waiting for use by the UE during the set up phase (a timeout deletion maybe enforced for these).

The GGSN of the visited operator, upon receipt of the token, shall be mandated to issue a 'policy-implemented' indication, and piggyback the 'policy indication' in the PDP context activation/modification response message, which goes through the SGSN transparently to the home operator cost control node via the CAP interface.

The home operator cost control node, upon receipt of the 'policy indication', shall do the following interpretation:

That the UE has agreed to policy enforcement of the bearer by the visited operator, and that the visited operator has applied policy on the bearer. It will be possible to take into account discounts of policy controlled bearers during the charging clearance with the visited operator, depending on roaming agreements between the home and visited networks. It will be possible to give the UE subscriber a discount in the use of the bearer. Whether to actually do this or not depends on home operator choice or contract with the UE subscriber.

When the 'policy indication' is not received, the classic GPRS charging mechanism will apply.

4.2 Token from S-CSCF

Another Token may be used, which is issued by S-CSCF, to allow coordination of charging at session level and bearer level. The Token is named Token A to distinguish from the one discussed in Subsection 4.1.

Token A is issued by the S-CSCF when the operator (may be home or visited depending on call contrl model) who owns the service allows service-based charging on a per registration / session / media flow basis (operator decision). This means coordination of charging at session level and bearer level. Token A is passed on transparently from the S-CSCF to the UE during the session set up phase.

Token A is not issued by the S-CSCF when the service operator does not allow service-based charging at the registration / session / media flow level for the particular registration / session / media flow.

From the perspective of the user/UE, Token A corresponds to certain advantages and discounts with possible service-based charging. However, to avail of this, he might have to agree to some service level contracts with the service operator. The UE submits Token A during the PDP context activation/modification only if he agrees to this condition. Token A is sent transparently from the UE to the GGSN.

The GGSN of the visited operator, upon receipt of Token A, shall be mandated to piggyback Token A in the PDP context activation/modification response

message, which goes through the SGSN transparently to the home operator cost control node via the CAP interface.

The home operator cost control node, upon receipt of Token A, shall do the following interpretation:

That the UE has agreed to some service level contracts with the service operator and that coordination of charging at session level and bearer level can take place. It will be possible to take into account discounts of bearers during the charging clearance with the visited operator, and discounts of services with the service operator, depending on roaming / business agreements between the home and visited networks. It will be possible to give the UE subscriber discounts in the use of the bearer or service. Whether to actually do this or not depends on home operator choice or the contract with the UE subscriber.

When Token A is not received, the classic GPRS charging mechanism will apply.